

## **Advanced Computer Operating Systems**

### **Course Code 5323**

#### **COURSE DESCRIPTION:**

The **Advanced Computer Operating Systems** course is a continuation of the **Computer Operating Systems**. It is designed to prepare the student to perform advanced, detailed tasks related to computer operating system configuration (Windows). This course is designed for IT students who have experience with Windows devices and who will work as Windows Enterprise Desktop Support Technicians (EDSTs) in Tier 2 support environments with extensive hands-on labs students will learn how key components of the Windows Operating system work in order to aid in troubleshooting system problems. How to identify and resolve issues with networking, Windows Store apps, security, group policy, Internet Explorer, remote access, and support of mobile devices.

This course uses Desktop Optimization Package (MDOP), Application Compatibility Toolkit (ACT), Windows Performance Toolkit (WPT), and Microsoft Message Analyzer. The experienced IT students focus on a broad range of technical issues for Windows operating systems, devices, cloud services, applications, networking, and hardware support. Key responsibilities include resolving technical issues pertaining to Windows installation and migration, activation, performance, profiles, settings and device synchronization, local and remote network access, access to applications, access to data and printers, authentication, endpoint security and policy, operating system and data recovery. Students must combine technical expertise with problem solving and decision making skills and a deep understanding of their business and technical environments to quickly resolve support issues. They consider all variables, justify resolutions with a logical troubleshooting approach, and relate tradeoffs while adhering to business and technical requirements and constraints. Students are primarily responsible for the maintenance and support of desktops and devices, installing and testing line-of-business applications on these devices, and physically making changes to user devices or re-images as required. Students receive advanced instruction in operating systems, security, mobile devices, and troubleshooting. Laboratory activities provide instruction in installation, configuration, operation, maintenance, security, troubleshooting, and repair of industry-standard operating systems in accordance with industry certification standards.

**The most current listing of standards for this course/program can be found at industry websites such as the Microsoft Web site at Exam MS 70-685 & 70-688 Certifications**

**<https://www.microsoft.com/learning/en-us/exam-70-685.aspx>**  
**<https://www.microsoft.com/learning/en-us/exam-70-688.aspx>**

#### **OBJECTIVE:**

Given the necessary equipment, materials, and instruction, the student, on completion of the prescribed course of study, will be able to successfully accomplish the following standards.

*Revised February 2015*

**COURSE CREDITS:** 1 or 2 units

**PREREQUISITE(S):** Computer Operating Systems and/or passing score on applicable industry certification such as MCSA Exam MS 70-680 & 70-687

**RECOMMENDED GRADE LEVEL:** 11-12

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**A. SAFETY AND ETHICS**

1. Identify major causes of work-related accidents in offices.
2. Describe the threats to a computer network, methods of avoiding attacks, and options in dealing with virus attacks.
3. Identify potential abuse and unethical uses of computers and networks.
4. Explain the consequences of illegal, social, and unethical uses of information technologies, e.g., piracy; illegal downloading; licensing infringement; and inappropriate uses of software, hardware, and mobile devices.
5. Differentiate between freeware, shareware, and public domain software copyrights.
6. Discuss computer crimes, terms of use, and legal issues such as copyright laws, fair use laws, and ethics pertaining to scanned and downloaded clip art images, photographs, documents, video, recorded sounds and music, trademarks, and other elements for use in Web publications.
7. Identify netiquette including the use of email, social networking, blogs, texting, and chatting.
8. Describe ethical and legal practices in business professions such as safeguarding the confidentiality of business-related information.

**B. EMPLOYABILITY SKILLS**

1. Identify positive work practices, e.g., appropriate dress code for the workplace, personal grooming, punctuality, time management, and organization.
2. Demonstrate positive interpersonal skills, e.g., communication, respect, and teamwork.

**C. STUDENT ORGANIZATIONS**

1. Explain how related student organizations are integral parts of career and technology education courses.
2. Explain the goals and objectives of related student organizations.
3. List opportunities available to students through participation in related student organization conferences/competitions, community service, philanthropy, and other activities.
4. Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.

**D. Support operating system and application installation (30–35%)**

1. Support operating system installation
  - a) Support Windows To Go; manage boot settings, including native virtual hard disk (VHD) and multiboot; manage desktop images; customize a Windows installation by using Windows Preinstallation Environment (PE)
2. Support desktop apps
  - a) Desktop app compatibility using Application Compatibility Toolkit (ACT), including shims and compatibility database; desktop application co-existence using Hyper-V, RemoteApp, and App-V; installation and configuration of User Experience Virtualization (UE-V); deploy desktop apps by using Windows Intune
3. Support Windows Store and cloud apps
  - a) Install and manage software by using Office 365 and Windows Store apps; sideload apps by using Windows Intune; sideload apps into online and offline images; deep link apps by using Windows Intune; integrate Microsoft account, including personalization settings and Trusted PC

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**E. Support resource access (30–35%)**

1. Support network connectivity
  - a) IPv4 and IPv6, including transition technologies; names resolution, including Peer Name Resolution Protocol (PNRP) and Domain Name System Security Extensions (DNSSECs); wireless networks and connections; network security, including Windows Firewall and IP security
2. Support remote access
  - a) Virtual private network (VPN), including Connection Manager Administration Kit (CMAK); Remote Desktop Protocol (RDP), including Remote Desktop Services Gateway access; DirectAccess; remote administration; Network Access Protection (NAP)
3. Support authentication and authorization
  - a) Multi-factor authentication, including certificates, virtual smart cards, picture passwords, and biometrics; workgroup versus domain, homegroup, computer and user authentication, including secure channel, account policies, credential caching, and Credential Manager; local account versus Microsoft account; Workplace Join
4. Support data storage

- a) Distributed File System (DFS) client, including caching settings; storage spaces, including capacity and fault tolerance; optimizing data access by using BranchCache; OneDrive

5. Support data security

- a) Permissions, including share, NTFS, and Dynamic Access Control (DAC); Encrypting File System (EFS), including Data Recovery Agent; access to removable media; BitLocker and BitLocker To Go, including Data Recovery Agent and Microsoft BitLocker Administration and Monitoring (MBAM)

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**F. Support Windows clients and devices (35–40%)**

1. Support operating system and hardware

- a) Resolve hardware and device issues, including STOP errors and Reliability Monitor; optimize performance by using Windows Performance Toolkit (WPT), including Xperf.exe, Xbootmgr.exe, XperfView.exe, and Windows Performance Recorder (WPR); monitor performance by using Data Collector Sets, Task Manager, and Resource Monitor; monitor and manage printers, including NFC Tap-to-Pair and printer sharing; remediate startup issues by using the Diagnostics and Recovery Toolkit (DaRT)

2. Support mobile devices

- a) Support mobile device policies, including security policies, remote access, and remote wipe; support mobile access and data synchronization, including Work Folders and Sync Center; support broadband connectivity, including broadband tethering and metered networks; support Mobile Device Management by using Windows Intune, including Windows RT, Windows Phone 8, iOS, and Android

3. Support client compliance

- a) Manage updates by using Windows Update and Windows Intune, including non-Microsoft updates; manage client security by using Windows Defender, Windows Intune Endpoint Protection, or Microsoft System Center 2012 Endpoint Protection; manage Internet Explorer 11 security; support Group Policy application, including Resultant Set of Policy (RSOP), policy processing, and Group Policy caching

4. Manage clients by using Windows Intune

- a) Manage user and computer groups; configure monitoring and alerts; manage policies; manage remote computers

## Preparation resources

- [Deployment considerations for Windows To Go](#)
- [ACT deployment options](#)
- [Windows upgrade and migration considerations](#)
- [Remote access \(DirectAccess, routing, and remote access\) overview](#)
- [Windows authentication overview](#)
- [Choosing a BranchCache design](#)
- [Microsoft Virtual Academy: Endpoint protection in System Center 2012 SP1](#)
- [Repair and recovery](#)